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Effects of Field Pea Level and Processing in Finishing Diets

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Summary

Cattle were fed coarse rolled or whole field peas in a finishing diet to determine impact on finishing performance. The peas were included in the diet DM at 0%, 15%, and 30%. There were no significant differences in ADG, F:G, or carcass characteristics among processing methods or field pea level. DMI was significantly different due to level and not processing of peas. The DMI increased as the field peas inclusion increased to 30% the diet DM. Field peas can be fed whole and replace corn in the diet up to 30%.

Introduction

Field pea production has increased in the United States as well as western Nebraska. The majority of the field peas are grown under contract for human consumption. Field peas must meet a strict quality guidelines to enter the human market. The peas that are not eligible for human consumption are then available for livestock feed. Field peas can be used as a protein source since they contain 20-28% CP. However, large quantities are available and producers prefer to feed large quantities or higher inclusion rates to utilize the peas as an energy source as well as protein. Often, field peas are grown by producers that own some livestock, but do not have grain processing equipment and the question arises as to the benefits of processing the peas before feeding. The objectives of this trial were to compare coarse rolled to whole peas in a finishing diet; and inclusion of 15% or 30% in dry-rolled corn finishing diets.

Table 1. Diet composition (DM basis) of rations containing whole or coarsely-rolled field peas.

	Treatments				
	DRC	15DRP	15WP	30DRP	30WP
Corn Silage	18.2	18.2	18.2	18.2	18.2
Corn	73.5	58.5	58.5	43.5	43.5
Peas	--	15	15	30	30
Supp ^b	8.3	8.3	8.3	8.3	8.3
Nutrient Content (NRC,1996)					
NEg	63.6	61.0	61.0	58.5	58.5
CP	13.5	13.5	13.5	13.6	13.6
Ca	0.81	0.77	0.77	0.72	0.72
P	0.34	0.35	0.35	0.35	0.35
K	0.55	0.63	0.63	0.72	0.72

^aDRC = dry rolled corn; DRP = dry rolled peas; and WP = whole peas.

^bSupplement contained: Protein content for control supplement was 58% CP, 9% calcium, 80 grams of Rumensin/ton, and 190 grams of Tylan/ton. Supplement for 15 and 30% peas were similar except protein was 12 and 18% respectively.

Procedure

Two hundred and five crossbred yearlings steers (average weight = 1068 lb) were randomly assigned to 20 pens and then pens were assigned randomly to five treatments. Initially cattle were weighed and implanted with Synovex Plus. Cattle were in pens with 10-11 head per pen, and four pens per treatment. Cattle were fed whole or coarse-rolled peas at 15 and 30% of the diet DM or a dry rolled corn diet (Table 1). The peas were rolled through a roller mill with the objective of breaking the seed coat of the peas and breaking into two or more pieces. Combinations of two supplements were fed due to the protein content of the peas. Each supplement contained equal amounts of vitamins, trace minerals, and monensin, but the CP was 10% and 58%. Therefore, peas replaced corn and protein. The cattle were transitioned between the growing ration and a finishing ration in 21 days; using three steps with 10% concentrate replacing forage in each step to the final diet (fed for 7 days each). The cattle were fed an inclusion of field peas at 0%, 15%, and 30%; the peas were either fed whole

or course rolled. It was assumed the corn silage was 45% grain and 55% roughage giving 10% roughage DM in the final finishing diets. Cattle were fed a total 75 days to harvest and carcass data collected 18 hr after harvest. The data were analyzed in SAS using Proc Mixed with means separated with contrast statements testing level, processing and their interaction. Treatment means with ≤ 0.05 were considered significant.

Results

Cattle performance data are shown in Table 2. There were significant differences in DMI due to level, but not processing. The processing did not show an effect on intake, but as the field pea inclusion increased to 30% the DMI increased. However, there were no significant differences for ADG, or F:G between coarse rolled and whole peas or between levels. No significant differences in carcass data were detected. Numerically there appears to be several benefits in processing when 30% peas were fed; however, in this trial the differences were not great enough to be statistically different. In conclusion, finishing cattle fed

Table 2. Performance of finishing cattle fed whole and coarsely cracked field peas.

	Treatments					P-value ^b		
	CON	15DRP	15WP	30DRP	30WP	Proc	Level	Interaction
DMI	24.5	24.5	24.5	25.2	25.0	0.457	0.0029	0.7449
ADG	3.69	3.94	3.82	4.06	3.75	0.1721	0.8597	0.5262
F:G	6.69	6.24	6.43	6.21	6.72	0.1784	0.593	0.5247

^aDRC = dry rolled corn; DRP = dry rolled peas; and WP = whole peas.

^bProc=Processing, Level= 0%, 15%, or 30% field inclusion, and interaction between the processing and level of peas fed.

whole or coarse rolled peas at 15 or 30% of DM gain similar to cattle fed corn and produce similar carcasses. In conclusion, cattle could be fed whole peas up to 30% of diet DM with good finishing performance.

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